

Major Cotton Pest in Akot Region District Akola, Vidharbha.

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ABSTRACT

Insects are found in all types of environment and they occupy little more than two thirds of the known species of animals in the world. Insects affect human beings in a number of ways. Many of them feed on all kinds of plants including crop plants, forest trees, medicinal plants and weeds. They also infest the food and other stored products in godowns, bins, storage structures and packages causing huge amount of loss to the stored food and also deterioration of food quality. Present study was made on major insect pest of cotton in Akot region during July -16 to Feb-17. At random collection of major pest was made from selected cotton cultivated area of Akot region. In present study we collected eight species samples from the cultivated cotton fields from Akot region area. In Akot region from the different sides like Popatkhed, Akola road, Vai area in the form of Bollworms, sucking pest, stainers, eg. *Eariasvittella* and *E. insulana*, *Pectinophora gossypiella*, *Amrascabiguttulabiguttula*, *Aphis gossypii*, *Thripstabaci Bemisiatabaci*, *Dysdercuscingulatus*, and *Oxycareus hyalipennis*.

Keywords: Major cotton pest , Akot region Akola .

INTRODUCTION

Insect pest are one of the major limiting factors in the cotton production. About, 1300 species of insects have been reported on cotton worldwide (Matthews and Tunstall, 1994). Out of which Caterpillars of six lepidopteron species are of great economic importance. Out of these nearly 130 species occur in India. About a dozen of these arthropods are commonly present in sufficient numbers requiring their management for better cotton yields. The key insect pests affecting cotton plant could be divided into three categories viz. boll worms, sap sucking pests and stem, leaf and foliar feeders depending on the type of damage caused. Major yield loss to the Indian cotton (even up to 60%) is due to bollworm complex consisting of three genera of bollworms viz. *Helicoverpa*, *Earias*, and *Pectinophora*, commonly referred to as American bollworm, Spotted bollworm and Pink bollworm respectively. Sucking pests i.e. jassids, aphids, whiteflies and thrips are deleterious during early season of the cotton plant growth and development and have the ability to build up to

serious proportions as a result of rapid breeding. The important foliage feeder includes semilooper, spodoptera, leaf roller, and ash weevil and grass hoppers. The variations are observed on geographical basis regarding occurrence of insect pests. Cotton, *Gossypium hirsutum* L., is subject to attack by wide variety of insect pests. The number of insect pests in cotton recorded were 1326 species (Hargreaves, 1948), 46 groups (Aston and Winfield, 1972) and 20 to 60 species (Luttrell et al., 1994). Luttrell (1994) emphasized that although the number of species recorded in the crop varied from region to region, 5-10 key pests caused significant crop damage.

MATERIALS AND METHODS

The study area was located in Akot region, in Akola district. Maharashtra, India Akot is located at 21.1° N 77.06° E it has an average elevation of 345 meters. The investigation was carried out for a period of six months from July 2016 to February 2017. Sampling was conducted in 6 month at the randomly from selected cotton field. Sampling was done every month from quadrates. Cotton pest were collected from 1 quadrate (1 sq. m x 1 sq. m). Placed at four corners and one center of 10 sq. m x 10 sq. m area by visual search method between 8.00 -10 hours. A sufficient area was left to avoid edge effects. All 1 quadrates were searched. Pest can be collected from the plant of cotton. Fresh Specimen from each quadrate were brought in the laboratory for identification for this we take photograph with help of stereo-zoom microscope from dorsal, ventral and lateral side of the specimen then preserved in 70 % alcohol.

RESULT

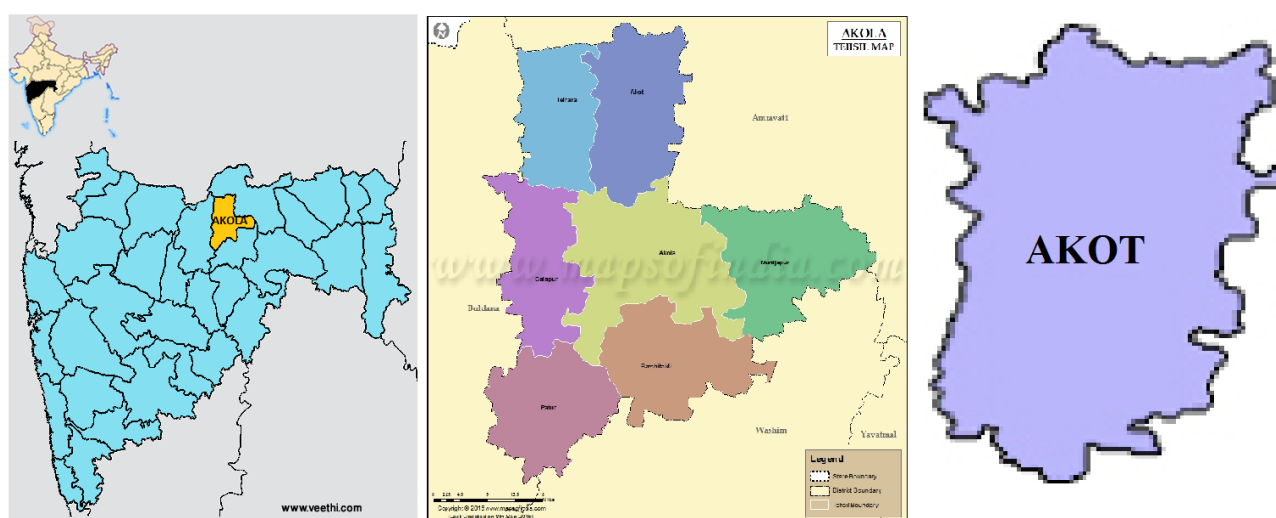
Collection identification and nature of damage, life history of important cotton pest and their management were studied from July 2016 to February 2017. Eight species of insect pest were collected and identified on the cotton crop of Akot region. Insect pests are one of the major limiting factors in cotton production. Of 1326 insect pests recorded on Cotton worldwide, nearly 130 species occur in India. About a dozen of these arthropods are commonly present in sufficient numbers requiring their management for realizing better cotton yields.

Among these insect pests we have collected different developmental stages of red cotton bugs from cotton cultivated area during month of February 2017.

Nymph: There are two instars present in life cycle of red cotton bug. Both 1st and 2nd nymphal instars can show small reared white bands on abdomen and black markings on the wings respectively.

Adult: Adult are reddish brown with white bands on the abdomen and black markings on the wing with high percentage as compared to nymphs.

In present study I have found bollworms, sucking pest and stainers. In bollworms I have found pink bollworms and spotted bollworms. In sucking pest I have found jassids, aphids, thrips, and whiteflies. And in stainers red cotton bug and dusky cotton bug present.



Map Akot Region: District Akola, Vidharbha, Maharashtra, India

Bollworms-



A) Spotted and spiny bollworms



B) larvae



C) Adult moth



A) Pink bollworms :eggs



B) larvae



C) Adult moth

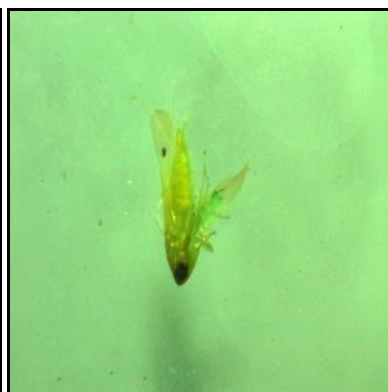
Sucking pests-



A) Jassids :Dorsal view



B) Lateral view



C) Ventral view



A) Aphids colony on cotton leaf



B) Aphids :nymph



C) Adult aphids



A] Thrips :Dorsal view

B] Lateral view

C] Thrips on cotton leaf



A] Whiteflies colony on cotton leaf



B] Adult whiteflies : Lateral view



C] Dorsal view

Stainers-



Red cotton bug - nymphal instar 1: Dorsal view



B] Lateral view



C] Ventral view



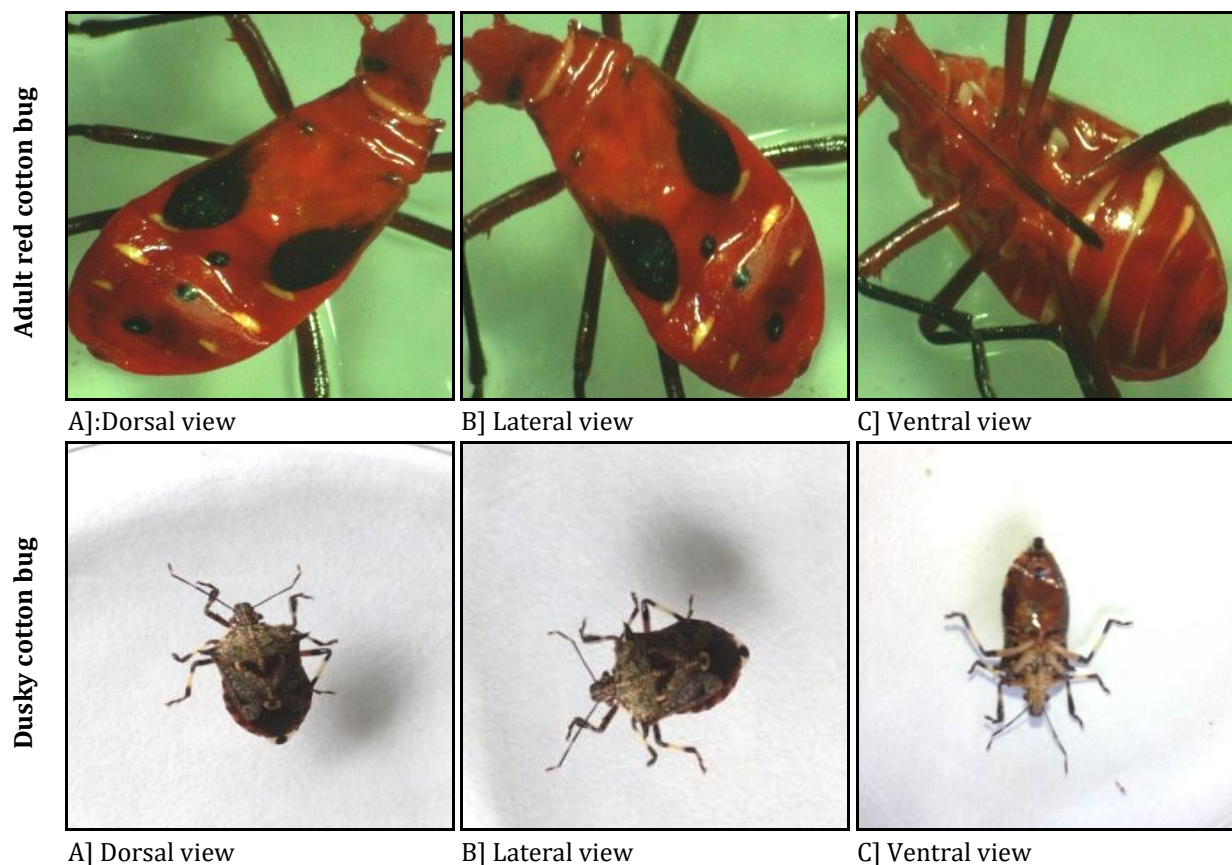
A] nymphal instar 2: -Dorsal view



B] Lateral view



C] Ventral view

**Table 1:** Major Cotton pest of Akot region District Akola during July 2016- February 2017.

S. N.	Insect pest	Scientific name	Symptoms of damage
A Bollworms			
1	Spotted and spiny bollworms	<i>Eariasvittella</i> and <i>E. insulana</i>	Bore mark in main shoot, dried and withered away shoot, twining of main stem due to axillary monopodia, feeding holes in flower buds and bolls blocked by excrement.
2	Pink bollworm	<i>Pectinophora gossypiella</i>	"Rosetted" bloom, pink larvae inside developing bolls with interloculi movement.
B Sucking pests			
1	Jassids	<i>Amrascabiguttulabiguttula</i>	Affected leaves curl downwards, turn yellowish, then to Brownish before drying and shedding, "hopper burn" stunts young plants.
2	Aphids	<i>Aphis gossypii</i>	Leaf crumpling and downward curling of leaves, sticky cotton due to deposits of honey dew on open bolls.
3	Thrips	<i>Thrips tabaci</i>	Leaves of seedlings become wrinkled and distorted with whitish patches, older crop presents rusty appearance from a distance.
4	Whiteflies	<i>Bemisia tabaci</i>	Upward curling of leaves, reduced plant vigor, lint contamination with honey dew and associated fungi, transmission of leaf curl virus disease.
C Strainers			
1	Red cotton bug	<i>Dysdercusingulatus</i>	Feed on developing and mature seeds, stain the lint to typical Yellow color, reddish nymphs seen in aggregations around developing and open bolls, affected seed yield low oil.
2	Dusky cotton bug	<i>Oxycarenushyalipennis</i>	Associated with ripe seeds, all stages characterized by a powerful smell, discolour the lint if crushed, affected seed yield low oil

From above samples I have taken photographs of jassids, aphids, red cotton bug and dusky cotton bug from stereozoom microscope. Further remain samples photograph was taken from internet sources because they are not taken clearly in stereozoom microscope due to some clarity problem. (Photo source: www.google.com)

DISCUSSION

Pest problem is one of the major constraints for achieving higher production in agricultures crops. India losses about 30% of its crops due to pest and disease each year. Agriculture has been facing the destructive activities of numerous pests like fungi, weeds and insects from time immemorial, leading to radical decrease in yields. Pests are constantly being introduced to new areas either naturally or accidentally, or, in some cases, organisms that are intentionally introduced become pests. Global trade has resulted in increased numbers of invasive non-native pest species being introduced to new areas. Controlling these invasive species presents an unparalleled challenge worldwide. (Salma et al. 2011).

In present study a total eight species of cotton pest collected from cotton cultivated fields. From cotton crop field I have collected pink bollworms, spotted bollworms, sucking pest like jassids, aphids, thrips, whiteflies, and stainers like red cotton bug and dusky cotton bug.

Many host records periods of abandon growth of pest and feeding behavior under normal condition. All the life stages apart from eggs and pupae cause damages through direct feeding, inserting their stylet into leaf veins and extracting nourishment from phloem sap. As a byproduct of feeding, honey dew is excreted and that alone can be a second major source of damage.

Larvae cause damage by consuming foliage. Young larvae initially consume leaf tissue from one side leaving the opposite epidermal layer intact. By the second and third instar larvae began to make holes on leaves and eat edges of leaves inwards.

Spotted bollworms can damage to cotton crop by boreholes in main shoot, dried and withered away shoot, twining of main stem due to axillary monopodia, feeding holes in flower buds and bolls blocked by excrement.

Pink bollworms damage cotton crop by "Rosetted" bloom, pink larvae inside developing bolls with interloculi movement.

Jassids can damage cotton crop. Affected leaves curl downwards, turn yellowish, then to brownish before drying and shedding, "hopper burn" stunts young plants.

Aphids can damage cotton crop by leaf crumpling and downward curling of leaves, sticky cotton due to deposits of honey dew on open bolls.

Thrips can damage cotton crop by leaves of seedlings become wrinkled and distorted with white shiny patches, older crop presents rusty appearance from a distance.

Whiteflies can damage cotton crop by upward curling of leaves, reduced plant vigour, lint contamination with honey dew and associated fungi, transmission of leaf curl virus disease

Red cotton bug can damage cotton crop by feed on developing and mature seeds, stain the lint to typical yellow colour, reddish nymphs seen in aggregations around developing and open bolls, affected seed yield low oil.

Dusky cotton bug cotton crop by associated with ripe seeds, all stages characterized by a powerful smell, discolour the lint if crushed, affected seed yield low oil (Vennila et al., 2000).

CONCLUSION AND SUMMARY

In present study during July 2016 to February 2017 I have collected eight species samples from the cultivated cotton fields from Akot region area. In Akot region from the different sides like Popatkhed, Akola road, Vai area I have collected samples from cotton field like bollworms, sucking pest, stainers, from the eight month of study periods at randomly.

In bollworms I have collected spotted bollworms, pink bollworms. In sucking pest I have found jassids, aphids, thrips, and whiteflies. In stainers I have found red cotton bug and dusky cotton bug. The bollworms can damage cotton field by damaging bolls of cotton crop, in case of jassids the affected leaves curl

downwards, turn yellowish, then to brownish before drying and shedding. Aphids can attack on leaf, the leaf crumpling and downwards curling of leaves, sticky cotton due to deposits of honey dew on open bolls is the main symptoms of aphids. Thrips can cause leaves of seedling become wrinkled and distorted with white shiny patches, older crop presents rusty appearance from a distance. Whiteflies can have attacked on leaves. upward curling of leaves, reduced plant vigour, lint contamination with honey dew and associated fungi, transmission of leaf curl virus disease.

The stainers like red cotton bug and dusky cotton bug when attack on cotton crop can cause the damage by feed on developing and mature seeds stain the lint to typical yellow color, reddish nymph seen in aggregation around developing and open bolls. Associated with ripe seeds, all stages characterized by a powerful smell, discolor the lint if crushed, affected seeds yield low oil. This causes of damage done by above mentioned stainers of cotton crop respectively.

Conflicts of interest: The authors stated that no conflicts of interest.

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